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AUTHOR Shell, Duane F.; And Others
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ABSTRACT

A study examined the relationships between the motivational variables of self-efficacy (the belief that one is capable of performing effectively) and outcome expectancies (contingency or causal dependency between actions and results) and performance in reading and writing. Subjects, 153 college students, completed measures of self-efficacy for reading and writing, outcome expectancy, reading achievement, and writing achievement. Data analysis revealed that self-efficacy and outcome expectancy beliefs are significant predictors of reading and writing performance. If persons experience reading and writing as important behaviors related to desired life goals both for themselves and for others, they will be more likely to engage in reading or writing activities and to persist in reading or writing tasks. (FL)

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Self-Efficacy and Outcome Expectancy: Motivational Aspects of Reading and Writing Performance

Duane F. Shell

University of Nebraska-Lincoln

Carolyn Colvin Murphy

San Diego State University

Roger Bruning

University of Nebraska-Lincoln

Date submitted: March 17, 1987

Running Head: MOTIVATIONAL ASPECTS OF READING AND WRITING

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Abstract

The study examined the relationship between motivational variables and reading and writing performance. Efficacy for reading and writing tasks and component skills and outcome expectancies for reading and writing were assessed and hypothesized to account for signficant variance in reading and writing achievement. Achievement was measured with the Degrees of Reading Power Test and by a holistically scored writing sample. Results from regression and canonical analysis showed a strong motivational component in reading and writing achievement. Implications of the results for reading and writing models and for understanding the role of motivation in reading and writing achievement were discussed.

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Self-Efficacy and Outcome Expectancy: Motivational Aspects of Reading and Writing Performance

Bandura (1977, 1982) has proposed that motivation and performance are related to two dimensions: self-efficacy and response-outcome expectancy. Self-efficacy is defined as behavioral confidence or the belief that one is capable of performing a behavior effectively (Bandura, 1977, 1982; Weisz & Stipek, 1982). Outcome expectancy is defined as the contingency or causal dependency between actions and outcomes (Bandura, 1977; Schunk, 1984; Weisz & Stipek, 1982) and is conceptually similar to Rotter's (1966) construct of internal-external locus of control.

Numerous researchers have noted a combined effect of self-efficacy and outcome expectancy on motivation (Bandura, 1982; Schunk, 1984; Weisz & Stipek, 1982). Persons are motivated to select and persist in behaviors that they are confident they can successfully perform and that they feel are related to obtaining desired outcomes. Specifically, efficacy and outcome expectancy affect choice of behavior and persistence in chosen behaviors, thereby determining the amount of time and effort that will be expended in increasing behavioral skill. Therefore, motivation supplied by efficacy and outcome expectancy beliefs is a critical determiner of the level of achievement that will be realized in any skill area.

A primary focus of the educational system is the development of skilled performance in reading and writing. To the extent that self-efficacy and outcome expectancy affect the development of skilled performance, they would be expected to be significant determiners of ultimate achievement in both these areas. This relationship between self-efficacy and outcome expectancy beliefs about reading and writing and individuals' actual reading and writing performance was the focus of this study.

Self-Efficacy and Outcome Expectancy Mechanisms

Self-efficacy beliefs are derived from a person's evaluation of past performance (Bandura, 1982), including the relationships perceived between behavior and performance (Chambliss & Murray, 1979a, 1979b) and perceived causality of performance outcomes (Schunk, 1983, 1984). Generally, efficacy beliefs are strongly related to actual performance accomplishments and, thus, reflect performance competence as well as perceived confidence. High levels of self-efficacy motivate performance through choice of activity, higher effort expenditure, and greater persistence (Bandura, 1982; Schunk, 1984). Self-efficacy beliefs have been found to be related to performance in a variety of clinical and academic settings (Bandura, 1982; Bandura, Adams, Hardy & Howells, 1980; Chambliss & Murray, 1979a; Greene, 1985; Shell, 1985; Schunk, 1984).

Outcome expectancy beliefs arise from perceptions about causality (Stipek & Weisz, 1981; Weiner, 1979) and experienced contingencies (Rosenbaum & Hadari, 1985). Expectancy beliefs reflect perceptions about the causal relationships between behavior and outcomes. Strong outcome expectancy, in the form of perceived contingency between behavior and desired outcomes, motivates performance by increasing task persistence and effort expenditure (Mischel, Zeiss, & Zeiss, 1974; Shell, 1985). Expectancy beliefs may reflect either general causality between personal actions and outcomes, as in locus of control (Rotter, 1966; Stipek & Weisz, 1981), or a more specific causal relationship between particular behaviors and their outcomes (Marsh, Cairns, Relich, Barnes, & Dubus, 1984; Weiner, 1979). While research has found outcome expectancy beliefs to be related to improved academic performance (Brewin & Shapiro, 1984; DeVolder & Lens, 1982; Stipek & Weisz, 1981), other studies have found no significant relationship between outcome expectancy beliefs and academic performance (Green, 1985; Shell, 1985). Expectancy beliefs have, however, been found to be related to study persistence, study time, and study effort, (DeVolder & Lens, 1982; Shell, 1985), suggesting that outcome expectancy beliefs may exert an indirect influence on performance by increasing effort and persistence for behaviors that affect performance improvement, rather than being directly related to the performance area itself.

Since efficacy beliefs arise from past performance and outcome expectancy beliefs develop from experienced contingencies, efficacy level is related to existing skill level and outcome expectancy level is related to actual contingency relationships between behavior and outcomes. Therefore, efficacy and outcome expectancy reflect actual skill as well as motivate performance. This dual aspect of efficacy and outcome expectancy as both motivators and indicators of performance constitutes what Bandura (1982) calls a self-regulatory system. The person engages in a behavior and is successful. This leads to increases in efficacy and outcome expectancy for the behavior. These in turn motivate the person to engage in the behavior again resulting in further success, which leads to further increases in efficacy and outcome expectancy. Efficacy and outcome expectancy, therefore, mediate future activity by motivating the person toward those behaviors where success is most likely to occur based on past experience.

The self-regulatory system evidenced for efficacy and outcome expectancy is especially important for performance improvement, particularly for skills that require repeated engagement in task related behaviors. Those individuals with high efficacy and outcome expectancy for the skill will be motivated to engage in skill-related behaviors and persist in those behaviors, thereby improving performance. In contrast, those with low efficacy and/or outcome expectancy will be less likely to engage in the

behavior or persist in the face of difficulty. For the latter the lack of practice and persistence leads to lower performance resulting in lower efficacy and expectancy of reinforcement, producing less future motivation. The self-regulatory system, thus, becomes negative, leading to lower achievement. Bandura (1982) has suggested that this type of negative system can create a sense of futility and lack of trying.

Motivation in Reading and Writing Performance

Current theories portray both reading and writing proficiency as dependent on the development of automaticity of both bottom-level perceptual mechanisms and higher level cognitive processes (Carpenter & Just, 1981; Hayes & Flower, 1980; Perfetti & Roth, 1981; Rumelhart, 1980; Stanovich, 1984; Stanovich & West, 1981; Stotsky, 1975; Tierney & Pearson, 1983). Inherent in the notion of automaticity is the need for overlearning through repeated engagement with reading and writing tasks. Consistent with this view is research that has shown the utility of repeated engagement for improving performance in various aspects of reading (e.g., O'Shea, Sindelar & O'Shea, 1985; Stahl & Fairbanks, 1986) and writing (e.g., Stotsky, 1975).

The importance of repeated engagement in reading and writing activities in the development skilled performance and an increasing recognition of the importance of motivational variables in affecting task engagement and persistence has begun to lead to

models that propose a critical role for motivation in the attainment of skilled reading or writing performance (Lipson & Wixson, 1986; McCarthy, Meier & Rinderer, 1985; Paris & Oka, 1986). These views have been built on research relating motivational variables to reading and writing, which has shown that poor readers have lower expectancy of reading success (Butkowsky & Willows, 1980); that causal attributions to ability correlate with self-perceived achievement and teacher ratings of achievement (Nicholls, 1979); that self-perceptions of reading competence, perceived contingencies between reading and desirable outcomes, general cognitive competence, and internal motivation are related to reading performance (Paris & Oka, 1986); and that higher self-efficacy beliefs are related to better writing performance (McCarthy, Meier & Rinderer, 1985).

Findings such as these indicate that motivational variables related to the dimensions of self-efficacy and outcome expectancy potentially are critical for the development of skilled reading and writing performance. To the extent that efficacy and outcome expectancy affect choice of activity and task persistence, the efficacy and expectancy self-regulatory system would be an important determiner of the amount of engagement in reading and writing activities.

Focus of the Study

This study examined the relationships between self-efficacy and outcome expectancy belief and performance in reading and writing. Since self-efficacy reflects past levels of performance, it was expected that efficacy beliefs would be significant predictors of current achievement in reading and writing. Because of the direct link between efficacy and past performance, Bandura (1982) suggests that self-efficacy will be the stronger predictor of performance, with outcome expectancy beliefs accounting for a lesser amount of variance.

Bandura (1982) and Stipek and Weisz (1981) note that efficacy and outcome expectancy beliefs can generalize to behaviors in related domains. Since reading and writing are related language-based activities (Shanahan & Lomax, 1986; Tierney & Pearson, 1983), it is possible that efficacy and outcome expectancy beliefs in one area could affect motivation toward the other. If this is true, then efficacy and outcome expectancy beliefs for one of the areas should predict achievement in the other. The degree to which efficacy and outcome expectancy beliefs generalize, however, will depend on the degree to which reading and writing are viewed by individuals as conceptually distinct from one another or conceptually similar.

To examine the generality of efficacy and outcome expectancy relationships between reading and writing achievement, efficacy

and outcome expectancies for both were studied in the same sample of individuals. We hypothesized that reading and writing achievement would be significantly correlated and that efficacy and outcome expectancy scores for one area would significantly predict performance in the other. Consistent with the notion that generalized effects would not be as strong as direct effects, however, efficacy and outcome expectancy beliefs across domains were expected to be significantly less strong predictors than direct beliefs within each domain.

Method

Subjects

Subjects were 153 undergraduate college students from a midwestern state university. The sample consisted primarily of sophomore and junior students in a teacher preparation program.

Measurement of Variables

Self-Efficacy. This study employed separate measures of self-efficacy for reading and self-efficacy for writing. Instruments were developed by the researchers based on criteria outlined by Bandura (1982) for measuring efficacy beliefs. Bandura suggests establishing questions representing tasks of varying difficulty and then asking subjects to designate how certain they are that they can perform each task by indicating a level of subjective probability from zero (no chance) to 100 (complete certainty). Self-efficacy belief is reflected as an

average subjective probability across all tasks. Both the reading and writing efficacy scales contained two subscales. One subscale contained general reading or writing tasks of varying difficulty and the other consisted of component skills involved in reading or writing.

The reading task subscale contained eighteen reading tasks of varying difficulty. For each task, subjects were asked to rate their confidence in being able to read and understand what the author was saying on a scale of zero (no chance) to 100 (completely certain). Sample items are "A letter from a friend or family member" (low difficulty), "An introductory textbook in your major field" (medium difficulty), and "A scholarly article in a professional journal in your field" (high difficulty). The reading component skill subscale contained nine skills. Subjects were asked to rate their confidence in being able to perform each skill on a scale of zero (no chance) to 100 (completely certain). Sample items are "Recognize parts of speech (nouns, verbs, adjectives, etc.)" and "Understand compound and complex sentences."

Similarly, the writing task subscale contained sixteen writing tasks of varying difficulty. For each task, subjects were asked to rate their confidence in being able to successfully communicate what they wanted to say on a scale of zero (no chance) to 100 (completely certain). Sample items are "Write a one- or

two-sentence answer to a specific test question" (low difficulty), "Write a letter to the editor of the daily newspaper" (medium difficulty), and "Compose an article for a popular magazine such as Newsweek" (high difficulty). The writing component skill subscale contained eight skills. Subjects were asked to rate their confidence in being able to perform each skill on a scale of zero (no chance) to 100 (completely certain). Sample items are "Correctly punctuate a one-page passage" and "Organize sentences into a paragraph so as to clearly express a theme."

Instruments were analyzed to determine reliability and item discrimination. Results indicated that the self-efficacy instruments were highly reliable and had high levels of discrimination. Reliability, assessed with Cronbach's alpha, exceeded .92 for all reading and writing subscales. Item-total correlations between subscale items and subscale scores were greater than .40 for all items except Item 1 of the reading task efficacy subscale (Read a letter from a friend or relative), which was .33.

Outcome Expectancy. In separate outcome expectancy instruments subjects were asked to rate the importance of reading and writing for achieving various life goals on a 7-point Likert scale from 1 (Extremely Unimportant) to 7 (Extremely Important). Each outcome expectancy measure contained the same twenty items consisting of goals selected from the domains of employment,

social activities, family life, education and citizenship. Scores were obtained by averaging subject ratings across all items. Sample items are "Getting a job" (employment), "Having many friends" (social), "Raising children properly" (family), "Graduating from college" (education), and "Being a good citizen" (citizenship).

Instruments were analyzed to determine reliability and item discrimination. Reliability, assessed with Cronbach's alpha, was .93 for both expectancy measures. Item-total correlations exceeded .40 for all items.

Reading Achievement. The Degrees of Reading Power (1983) is a 63-item cloze format instrument aimed at measuring reading comprehension (see Bruning, 1985). Subjects are presented passages with words deleted. Multiple choice alternatives are provided for each deleted word and subjects select the best choice consistent with the meaning of the passage. The instrument is scored by summing the correct responses, with higher scores indicating greater reading comprehension. The college-level version of the test was used.

Writing Achievement. Subjects were given a twenty minute period to respond to the following essay question "What do you believe to be the qualities of successful teacher?". Subjects were instructed to prepare an organized essay reflecting a completed paper. These essays were scored blind by two of the

researchers using a holistic scoring method that analyzed realization, logic clarity, organization, density, and language usage. A value of 0 - 3 was assigned for each of the five categories, resulting in a total score of 0 - 15. Each subject's overall writing score was obtained by averaging the holistic scores of the two raters. Interrater reliability, assessed by correlating the scores of the two raters for all subjects was .75.

Procedures

Subjects received the self-efficacy and outcome expectancy instruments in the form of a take-home questionnaire at the time of recruitment. Groups of 20 - 50 subjects completed the writing essay and the Degrees of Reading Power under standard conditions, during one of five sessions. The writing essay was administered as a timed test at the start of each session, followed by the Degrees of Reading Power.

Data Analysis

Multiple regression analysis was used to examine relationships between efficacy and outcome expectancy and reading and writing achievement. Individual models were developed for reading and writing using only the efficacy and expectancy measures for each. Generalized models for reading and writing then were developed using efficacy and expectancy scores from both areas in the

analysis. Stepwise selection was utilized to generate the most parsimonious model.

Since previous research (Green, 1985; Shell, 1985) had found that outcome expectancy beliefs were not linearly related to performance, both reading and writing expectancy scores were examined for the possibility of a non-linear relationship to performance. This was done by generating a vector for the quadratic relationship using the square of the expectancy score combined with the expectancy score in the regression equation. Results of this analysis indicated that reading expectancy had a significant curvilinear relationship (r = .25, p = .0066) with reading achievement. Writing expectancy showed an increased correlation with performance using the curvilinear equation (r = .17 compared to r = .13); however, neither of these correlations were significant.

Since outcome expectancy had a significant non-linear relationship to performance for reading and a higher non-linear relationship for writing, the non-linear model was used in all analyses for these variables. Because the score and the square of the score must be entered together to reflect the curvilinear relationship, stepwise selection procedures cannot be used because they would separate the variables. To overcome this limitation in model testing, the models were first constructed using stepwise selection for efficacy measures only. The non-linear variables

for outcome expectancy were then entered into the final model and significance was tested by the change in variance accounted for by the addition of the expectancy variables. This procedure allows for testing whether the addition of expectancy improves on the best efficacy-only model that can be derived. A significance level of $\alpha < .05$ was established for all statistical tests.

Results

Means, standard deviations, and zero-order correlations between measured variables are provided in Table 1. Mean self-efficacy and outcome expectancy scores are higher for reading than for writing. Also, mean DRP reading scores and mean holistic writing scores indicate that subjects had relatively better reading performance (57.83 out of 63) than writing performance (8.81 out of 15).

Insert Table 1 about here

Reading and Writing Regression Models

Regression results for the individual reading and writing models are presented in Table 2. The reading model includes the efficacy subscale score for component skills and the curvilinear outcome expectancy score. The final model accounted for a significant amount of variance in reading performance ($R^2 = .32$, $F(3, 149) = 23.81$, $p < .00001$). This model reflects the

hypothesized relationship of efficacy and outcome expectancy to performance, with efficacy being the strongest predictor.

The final writing model likewise accounted for a significant amount of variance in writing performance ($\underline{R}^2$ = .10, $\underline{F}(1, 151)$ = 17.12, $\underline{p}$ = .0001); it included only the efficacy subscale score for writing component skills. Like the reading model, the writing model reflects the hypothesized relationship between efficacy and performance, though the strength of the relationship for writing is not as strong as for reading. The hypothesized contribution of outcome expectancy to performance was not found for writing.

Insert Table 2 about here

The final generalized regression models for both reading and writing are provided in Table 2. The final reading model includes the efficacy subscale score for reading component skills, the efficacy subscale score for writing component skills and the curvilinear outcome expectancy score. This model accounted for a significant amount of variance in reading performance ($\underline{R}^2$ = .34, $\underline{F}(4, 148)$ = 19.06, $\underline{p} < .00001$). The generalized model reflects the hypothesized grouping of direct efficacy, direct outcome expectancy and generalized efficacy from a related domain.

The final writing model contains the efficacy subscale score for reading component skills and the efficacy subscale score for reading tasks. This model accounted for significant variance in

writing performance (R^2 = .13, $F(2, 150) = 11.13$, $p < .00001$). Since scores reflecting generalized efficacy from the reading domain are the only significant predictors in the final writing model, the generalized writing model does not conform to the hypothesized relationships.

Canonical Correlation Model

Efficacy subscale scores were highly correlated (see Table 1), which makes the final regression equations potentially unstable. Also, the dependent measures of reading and writing achievement were significantly correlated (r = .25, $p > .01$). To analyze the correlations between variables and examine the extent to which reading and writing were viewed by subjects as related domains, a canonical correlation analysis was conducted. Canonical correlation is a multivariate test of the relationship between a set of independent and a set of dependent variables. The analysis examines the degree to which the best linear combination of independent variables is related to the best linear combination of dependent variables. To enter the non-linear outcome expectancy relationship into the analysis, the curvilinear regression equations for the DRP on reading expectancy and the holistic writing score on writing expectancy were used to generate predicted scores. These predicted scores were entered into the analysis in place of the original expectancy scores.

The canonical analysis identified a significant canonical

correlation between the independent and dependent variables (R_c = .62, Wilks' λ = .584, Rao' $F(12,290) = 7.454$ $p < .0001$), containing one significant canonical variate. The linear combination of the independent self-efficacy and outcome expectancy variables accounted for 39% of the linearly combined variance in reading and writing achievement. The canonical variate is unipolar indicating that high efficacy and curvilinear outcome expectancy are related to high achievement in both reading and writing and that subjects were perceiving reading and writing as related rather than unique domains.

Insert Table 3 about here

Correlations of the original variables with the canonical variate are reported in Table 3. The magnitude of the correlation indicates the relative contribution of each variable in the canonical relationship. For the dependent variables, the Degrees of Reading Power score contributes more strongly to the relationship; however, writing scores are also highly related. For the independent variables, component skill efficacy scores for both reading and writing contribute the most to the relationship. Task efficacy and reading outcome expectancy are, however, correlated at moderately high levels. The hypothesis that efficacy is more strongly related to performance than outcome expectancy is supported by the higher correlations for all

efficacy measures than for either curvelinear expectancy measure. The correlation for reading expectancy does, however, suggest that outcome expectancy has a moderate contribution to the relationship.

Discussion

Results from both regression and canonical correlation supported the main hypothesis that self-efficacy and outcome expectancy beliefs are significant predictors of reading and writing performance. These results are also consistent with previous findings that motivation is related to the attainment of reading or writing skill (Butkowsky & Willows, 1980; McCarthy, Meier and Rinderer, 1985; Nicholls, 1979; Paris & Oka, 1986). Canonical correlation results indicated that reading and writing were perceived by subjects as related domains. This finding matches well with models that portray reading and writing as related processes (Shanahan & Lomax, 1986; Tierney & Pearson, 1983). The identification of a strong relationship between reading and writing suggests that they share motivational components; therefore, increases in motivation for one area are likely to affect engagement in activities for both areas.

The high intercorrelations between efficacy scores and the results from canonical correlation suggest caution in interpreting regression results. When variables are highly correlated, as in the present study, the particular constellation of variables

selected by stepwise regression may be unstable; therefore, the exact composition of the final regression models is less important than the general trends identified. The trend in the generalized reading model was consistent with the hypothesized contributions of direct efficacy and generalized efficacy; however, the generalized writing model did not correspond to expectations, as reading efficacy was the strongest predictor of writing performance.

The representation in the regression models of a strong efficacy component and a weaker outcome expectancy component also is highly consistent with previous findings (Greene, 1985; Shell, 1985) and with the relationship of efficacy and outcome expectancy proposed by Bandura (1982). The curvilinear relationship identified between outcome expectancy and performance also supports past findings that expectancy beliefs are related to performance (Brewin & Shapiro, 1984; Stipek & Weisz, 1981; Weisz & Stipek, 1982).

The magnitude of the motivational effects identified in canonical analysis and regression indicate a strong motivational component in reading and writing achievement. Thirty-nine percent of the shared reading and writing variance was accounted for by the cluster of motivational variables in canonical analysis. A similar effect was found in reading regression results, where thirty-four percent of the variance in reading performance was

accounted for by the final model. A smaller, but still highly significant effect, was found for writing with thirteen percent of the variance in writing achievement accounted for by the final regression model. These results support models of reading and writing that emphasize motivation as a potentially significant factor in the attainment of reading and writing proficiency (Lipson & Wixson, 1986; McCarthy, Meier, & Rinderer, 1985; Paris & Oka, 1986).

An analysis of the reading--writing relationship conducted by Shanahan and Lomax (1986) helps explain the identified relationships between efficacy and performance, particularly the prediction of writing ability by reading efficacy and the different effect magnitudes found for reading and writing. Their study of elementary school (grades 2 and 5) children examined the relationships between reading and writing skills through causal modeling. Three potential models were fitted to the performance data: 1) a bidirectional interactive model, 2) an unidirectional reading-to-writing model, and 3) an unidirectional writing-to-reading model. For all subjects an interactive model best described the relationship between reading and writing, although for older (grade 5) subjects a reading-to-writing model fit the data almost as well.

Their results indicated a stronger relationship between lower and higher level skills for reading than for writing and a greater

influence of reading ability on writing than writing on reading. Of particular interest for the present study was the finding that in many cases reading ability exerted a stronger influence on writing ability than other writing skills. Results from the present study parallel the Shanahan and Lomax findings. Reading efficacy was more strongly related to reading performance than writing efficacy was related to writing performance. Also, reading efficacy was more strongly related to writing than writing efficacy was related to reading. In addition, the relationship of reading efficacy to writing performance was somewhat stronger than the relationship of writing efficacy to writing performance. Finally, the results of canonical analysis also lend strong support to an interactive model of reading and writing.

The similarity between the results of the present study and those of Shanahan and Lomax support a reading - writing model that includes both interaction between cognitive skills useful for developing proficiency in reading and writing and interaction between motivation for engaging in the reading and writing activities necessary for acquiring and improving those cognitive skills. Bandura's (1977, 1982) theory of self-efficacy postulates efficacy as the mediating mechanism between past performance and future behavior. In Bandura's self-regulatory system, past performance is seen as being translated into an efficacy belief that is then motivational toward future engagement in activities

that lead to improved performance and ultimately, new, higher efficacy beliefs. Thus, a strong link between efficacy and performance would be presumed, with similar patterns of influence for both.

The inclusion of motivational components into a reading--writing model provides increased explanatory and predictive power over a model containing only performance variables. Studies reported by Bandura and his associates (Bandura, 1977, 1982) have shown that efficacy beliefs are stronger predictors of future performance than past behavior and that change in efficacy precedes change in behavior. While the present study does not allow a within domain test of the relative contributions of prior performance and efficacy in predicting future performance, a cross domain test between reading and writing is possible. To assess the additional contribution of efficacy above past performance, reading scores were regressed on the holistic writing score and writing efficacy scores and holistic writing scores were regressed on DRP scores and reading efficacy. For reading performance, writing component efficacy provided a significant increase in explained variance beyond the holistic writing score ($\underline{R}^2$ change = .09, $\underline{p} < .0001$). For writing performance, reading component efficacy provided a significant increase in explained variance beyond the DRP score ($\underline{R}^2$ change = .05, $\underline{p} < .01$). These results support the previous findings of Bandura (1977, 1982) and suggest

that efficacy beliefs supply increased explanatory power in a combined motivation and performance model. These findings are tentative, however, and future research is needed to fully clarify relationship between motivation and past performance.

A further benefit of the motivational model examined in the present study is the inclusion of outcome expectancy beliefs, which are not directly related to past performance and efficacy (Green, 1985; Shell, 1985). Thus, a motivational model allows the inclusion of non-performance data. Non-performance related information may be particularly critical for prediction and explanation during the early stages of learning. When skill proficiency is insufficient to directly aid the development of other skills or to have led to high levels of self-efficacy, outcome expectancies may supply much of the motivation to continue to engage in skill development behavior. The curvilinear relationship between outcome expectancy and performance identified in the present study indicates that the relationship between expectancy and performance changes at different skill levels (being most predicative of mid-level performance) providing some support for this conceptualization.

Future research needs to examine the relationships between reading and writing further, with consideration of both skill and motivational components and the relative contributions of each. Of particular interest is the fact that skill patterns identified

in second and fifth grade by Shanahan and Lomax are reflected in motivational patterns identified in college students. In addition research needs to examine the developmental course of self-efficacy and outcome expectancy in relation to reading and writing improvement, with a particular emphasis on the relative contributions of the different motivational variables at different stages of learning.

Finally, in interpreting the present results, it is important to consider how efficacy and outcome expectancy likely develop. Bandura (1977, 1982) identified four sources for efficacy beliefs. In order of importance these are: (1) past performance, (2) vicarious experience, (3) verbal persuasion, and (4) emotional context. Since efficacy is strongly related to reading and writing performance, this means that reading or writing skill is primarily derived from the person's past experience with reading or writing and modeling of these skills done by others. Thus, the amount of reading a person does and the amount of reading that is modeled by others significantly affects the level of reading skill he or she achieves. Similarly, the amount of writing done and the amount of writing that is modeled affect the level of writing skill attained. Additionally, the relationship between motivation for reading and writing identified in canonical analysis suggests that the amount of experience and modeling in one of these areas will likely affect the level of performance in the other.

Similarly, outcome expectancies develop from experienced contingencies, vicarious reinforcement, and perceptions about causality (Rosenbaum & Hadari, 1985; Stipek & Weisz, 1981; Weiner, 1979). Motivation for reading or writing is derived from experiencing positive outcomes from reading or writing activities, observing others modeling reading and writing as activities contingently related to desired outcomes, and perceiving reading and writing skill as being related to personal actions. If persons experience reading and writing as important behaviors related to desired life goals both for themselves and for others, they will be more likely to engage in reading or writing activities and to persist in reading or writing tasks.

The efficacy and outcome expectancy self-regulatory system is consistent with models of reading and writing that focus on automaticity, developed through repeated engagement in reading and writing activities, as a primary factor in the attainment of reading or writing skill (Carpenter & Just, 1981; Hayes & Flower, 1980; Perfetti & Roth, 1981; Rumelhart, 1980; Stanovich, 1984; Stotsky, 1975). Where the self-regulatory system is positive, the person engages in reading or writing activities leading to better skill and higher motivation which in turn lead to further engagement in these activities. Where the system is negative the person ceases to engage in reading and writing activities, leading

to lower motivation and less chance of future engagement in necessary activities.

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Table 1

Intercorrelations of Measured Variables With Means and Standard Deviations on the Diagonal

	Reading				Writing			
Variable	1	2	3	4	5	6	7	8
Reading								
1. DRP	57.83	.52	.30	.05	.25	.37	.31	.04
Score	5.89							
2. Component		88.91	.65	.26	.33	.85	.67	.29
Efficacy		10.50						
3. Task			82.23	.16	.10	.50	.75	.24
Efficacy			10.14					
4 Outcome				5.46	.17	.26	.29	.85
Expectancy				.73				
Writing								
5. Holistic					8.81	.32	.17	.13
Score					2.60			
6. Component						86.90	.62	.32
Efficacy						12.37		
7. Task							75.87	.38
Efficacy							13.29	
8. Outcome								5.25
Expectancy								.77

Table 2

Models for Stepwise Regression of Reading and Writing Achievement on Self-Efficacy and Outcome Expectancy

Step	Variable	Cum. R	Cum. R^2	R^2 Change	F Change
	Individual Reading Model				
1	Reading Component Efficacy	.527	.278	.278	58.04**
2	Reading Outcome Expectancy	.569	.324	.046	5.11**
	Generalized Reading Model				
1	Reading Component Efficacy	.527	.278	.278	58.04**
2	Writing Component Efficacy	.551	.304	.026	5.61*
3	Reading Outcome Expectancy	.583	.340	.036	4.07*
	Individual Writing Model				
1	Writing Component Efficacy	.319	.102	.102	17.12**
	Generalized Writing Model				
1	Reading Component Efficacy	.325	.106	.106	17.82**
2	Reading Task Efficacy	.359	.129	.024	4.07*

Note. Outcome Expectancy variables were entered in curvilinear form following stepwise regression of efficacy variables in all models.

*p .05 **p .01

Table 3

Correlations Between Original Variables and the Significant Canonical Variate

Variable	Correlation
Dependent	
Degrees of Reading Power	.95
Holistic Writing Score	.55
Independent	
Reading	
Component Skill Efficacy	.90
Task Efficacy	.47
Outcome Expectancy	.45
Writing	
Component Skill Efficacy	.68
Task Efficacy	.53
Outcome Expectancy	.29

Note. Outcome expectancy variables were entered as predicted scores from the curvilinear regression equations.